

Jarvis (W.C.)

## A NEW METHOD

FOR THE

# REMOVAL OF LARYNGEAL GROWTHS

WITH ILLUSTRATIVE CASE

BY

DR. WILLIAM CHAPMAN JARVIS

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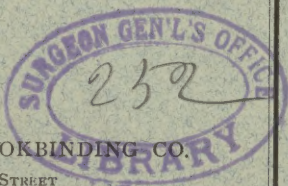
*Read at the Sixth Annual Session of the AMERICAN LARYNGOLOGICAL ASSOCIATION, May 13, 1884*

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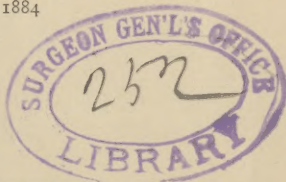
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"The very speedy removal of a large growth in Doctor Jarvis' case, and the ease with which the chromic acid can be employed with his instrument, will no doubt induce many who have heard the paper to try this means for removing growths from the larynx."—*Medical Times*, May 31st, 1884.

## A NEW METHOD FOR THE REMOVAL OF LARYNGEAL GROWTHS, WITH ILLUSTRATIVE CASE.

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It may appear presumptuous, at this late day, for any one to offer a novelty in a department of laryngology so extensively developed and upon a theme so well worn as that pertaining to laryngeal neoplasms, and this, too, before a body of experts skilled in the knowledge and practice of the various methods employed for their removal. Any hesitancy, however, on this score has been dismissed through personal conviction, based upon accumulated evidence, indicating the utility and in some respects the novelty of my method, reinforced by a special request to introduce the subject for your consideration and criticism.

My remarks will be confined to the employment of chromic acid for the removal of laryngeal papillomata. They are intended to be interpreted as a reclamation of this now generally neglected measure. The success which has attended the use of this escharotic in my hands has encouraged me to relate my experience and invite a fair trial in accordance with the rules laid down in this paper.

Of the several principles employed for utilizing the destructive activity of caustics, that of direct fusion has been adopted.

The truism that the result obtained from a given drug often depends upon the exact manner of its employment especially applies to chromic acid in this connection. Its crystals are fused upon the point of a probe, in contradistinction to grooves, cups, etc. Its usefulness depends upon the affinity of the salt for moist papilloma-

tous tissues. These tissues are effectively attacked and removed by this escharotic with unvarying constancy. The crimson chromic acid crystals, so called, are, more properly speaking, a trioxide of chromium,  $\text{CrO}_3$ , its combination with water forming the acid  $\text{CrO}_3\text{OH}_2$ .<sup>1</sup>

Chromium trioxide is highly deliquescent, immediately dissolving when applied to moist papillomatous tissues in small quantities.

I shall, in deference to general usage, designate the salt chromic acid. Chromic acid is immediately reduced in the presence of organic matter, the resultant salt being the sesquioxide of chromium  $\text{Cr}_2\text{O}_3$ . The organic matter is apparently dissolved by the oxidizing action of the acid, but when applied to a limited area its action ceases with the conversion of the salt into the chromium sesquioxide, which, as regards organic matter, is an insoluble and inert salt. This self-limiting action is a characteristic possessed by few of the other escharotics, and renders its application as a caustic safe, painless, and yet efficient.

Although chromic acid applied in small quantities at short intervals is capable of exerting a marked progressive destructive effect upon papillomata, its action upon the normal laryngeal mucous membrane is feeble and of brief duration. Its restricted activity in this respect constitutes an additional recommendation as indicating the perfect safety with which it can be carried into the cavity of the larynx.

A pronounced opinion against the use of chromic acid exists in the minds of some laryngologists. This feeling is well expressed by Dr. Morell Mackenzie in his celebrated work on "Laryngeal Growths," in the following sentence: "Since 1862 mechanical methods have almost entirely superseded the local application of caustics."<sup>2</sup> In a subsequent paragraph he includes chromic acid in the list.

<sup>1</sup> Fownes-Witthaus, etc.

<sup>2</sup> See also Morell Mackenzie: Diseases of Throat and Nose, vol. i., p. 320. 1880.



That such a prejudice should exist does not seem surprising when we consider the manner of its employment by certain operators. Every other consideration seems to have been sacrificed to obtain the speedy action of this and similar escharotics. As a consequence, most of the instruments devised for the laryngoscopic manipulation of chromic acid are arranged to contain the salt in large quantities, as, for instance, Tobold's, Türck's, and Mandl's applicators, Navratil's platinum cup, Fauvel's pincette, etc.

Hence, we find some authorities pronounce unsparingly against the use of the salt applied in substance to papillomatous tissues, others advise it but warn the operator of the constant suffering following its application to the larynx, and again others recommend escharotics only after a preliminary tracheotomy.<sup>1</sup> In opposition to these views, Lewin goes so far as to always recommend the trial of cauterization for the removal of small laryngeal growths before resorting to cutting instruments, claiming that even in the event of failure no harm results, and that the throat by this practice better tolerates the employment of other instruments. Special writers, however, seem more inclined to limit the employment of the salt to the secondary purpose of preventing the reformation of laryngeal growths.<sup>2</sup> It is therefore evident that the salt, when used alone, subserves a double purpose—namely, *it enucleates the growths and prevents their recurrence.*

The recognition of the fact that benign papillomata, in their regrowth, sometimes assume the character of a veritable epithelioma,<sup>3</sup> enhances the value of chromic acid as an anti-repullulative agent. Although chromic acid and nitrate of silver, developed among laryngoscopic methods side by side, have been indiscriminately em-

<sup>1</sup> G. Buck, M.D.: Transactions of the American Medical Association, vol. i. 1853.

<sup>2</sup> Dr. V. Bruns: Polyphen des Kehlkopfes, p. 7, etc.

<sup>3</sup> C. Wagner: Intra-Laryngeal Growths, Philadelphia Medical News, February 3, 1883.

ployed to obtain identical results, their action as escharotics has been shown to be dissimilar. A peculiar irritating action exerted by the silver, resulting sometimes in an actual increase of tissue,<sup>1</sup> is not possessed by the chromium salt. Furthermore, nitrate of silver has a tendency to spread when applied to mucous membranes.<sup>2</sup> The most important difference, however, between chromic acid and nitrate of silver, is the deliquescent character of the former, compared with the more tardy solubility of the latter, in the presence of moisture.

The introduction and employment of chromic acid for the removal of abnormal tissue formations is by no means recent. The late Dr. J. Marion Sims, who was present on an occasion when my method was employed, remarked that he had used chromic acid as a caustic in the early part of his professional career.

As has been already hinted, my plan is to *apply chromic acid in small quantities at short intervals*. This is best accomplished by means of a probe upon the point of which a tiny crystal of the salt has been fused. The probe should have a correct laryngeal curve. Its point, previously heated, is applied to a particle of the chromium crystals about as large as a millet-seed, or speaking more precisely a quantity varying in the neighborhood of one-sixth of a grain. The crystals fuse and adhere to the superheated metal, giving off chromium fumes. This fuming, which might result in the reduction or evaporation of the melted crystal, should be quickly interrupted by placing the probe near the palm of the hand and vigorously blowing upon it. The firmly adherent red bead is distinctly visible upon the dark surface of the chilled probe and can only be displaced by vigorous friction.

As soon as the patient has properly withdrawn the tongue the laryngoscopic mirror is placed in position and

<sup>1</sup> F. H. Bosworth, M.D.: Archives of Laryngology, vol. ii., p. 116.

<sup>2</sup> Türck: Klinik der Krankheiten des Kehlkopfes, p. 564.

steadied against the side of the mouth. The probe, grasped in the operator's right hand, is pressed against the opposite side of the mouth and with this point as a fulcrum is steadily advanced over the tongue until its point appears pictured in the laryngoscopic mirror. The angle of the laryngoscope is gradually altered, as the applicator advances, in order to keep the probe's point constantly toward the centre of the mirror. When the red dot on the probe's point is observed to be almost in contact with the growth, it is suddenly projected upon it by gently depressing the handle of the applicator. The chromium crystal vanishes from the end of the probe, reappearing as a minute white speck upon the point of application. This eschar soon assumes a yellow hue, growing darker as it gradually exfoliates. The sphacelated fragments are expectorated, leaving minute depressions upon the surface of the growth. In this way the papillomatous tissue is removed piecemeal. The irregular projections resulting from this chiselling process are levelled by successive applications of the acid and all the parts can be carved with the caustic, according to the operator's fancy. The curve of the probe has much to do with its proper manipulation, since its successful introduction into the larynx, depends more upon precision than dexterity. As the caustic is guided to its goal by directing the end of the probe, the wire should be curved to keep this objective point, constantly in view. A circumferential curve accomplishes this most efficiently, the point of impingement being the intersection of the radius with the arc of a circle at the base of the quadrant. Thus the instrument is readily directed by a simple curvilinear motion. A curvilinear bend, however, is not adapted to every laryngo oral axis; in these exceptional cases the ordinary elbow-angle must be adopted.

The use of the uncovered probe is sometimes attended with more or less difficulty. This difficulty is principally due to the unintentional deposit of the application upon

the base of the tongue and the neighboring structures or to involuntary closure of the glottis. Both of these obstacles have been overcome by the little instrument shown in Fig. 1. It accomplishes the first indication by protecting the chromium crystal until it reaches the point of application, and the second by surprising the larynx.

The instrument consists of a canula, containing a movable metallic rod, the latter being continued in the form of a spiral spring at the curved portion of the tube. A probe-pointed piece of wire is rivetted to the extremity of this spiral, to preclude the possibility of the accidental displacement and lodgment of the caustic-carrier in the larynx. The spring also serves as a buffer to deaden the force of the probe's impact against the growth.

The handle of the applicator is excavated to receive a spiral spring, acting upon the movable rod. A detent, *d*, drops between the teeth, *t*, and sets the spring. The nut, *n*, serves to regulate the tension of the spring. When not in use, the stylet, *s*, projects beyond the hood, thus permitting fusion of the chromium crystals upon it as with the ordinary probe.

When ready for use the probe's point is drawn within the tube by traction upon the milled nut, its return being prevented by the catch. The applicator can now be introduced without risking the loss of the application upon accidental points of contact.

It is not necessary to carry the end of the instrument directly upon the growth, since the probe-point is propelled some distance beyond the end of the tube, thus bridging over the interval of alarm.

A special feature of the instrument is the trigger device. This contributes the utmost steadiness, and, therefore, precision in manipulation, by securing instantaneous action with the smallest expenditure of force. The extremity of the probe is made of flexible metal, to permit its fixation at any angle. Mr. W. F. Ford, of Caswell, Hazard & Co., is the original manufacturer of this instrument.



FIG. 1.



The general utility of this method for the treatment of laryngeal growths is apparent, when we reflect that more than fifty per cent. of their number are papillomatous in character.

I have entered somewhat minutely into the details of my operation, more to prevent failure due to their neglect than from any personal inclination.

*Illustrative Case.*—In January, 1882, I met Miss F——, thirty years of age, of Norwalk, Conn., in consultation with Doctors R. G. Nolan and E. R. Reilly.

The patient first noticed her voice to be affected, in October, 1881. The hoarseness and difficulty in breathing slowly increased, and at the time of our examination she spoke in a strained and scarcely intelligible whisper.

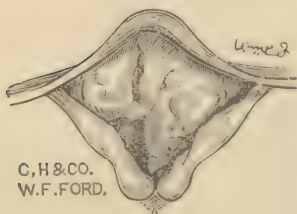


FIG. 2.

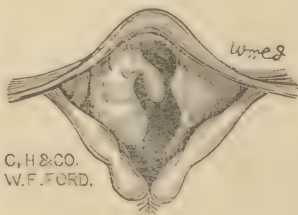


FIG. 3.

We discovered by laryngoscopy that the lumen of the larynx was almost entirely occluded. The laryngeal ventricles were obliterated, and the mass, as was afterward shown, projected far within the cavity of the larynx. It presented the usual appearances of a papilloma.

Fig. 2, copied from a sketch, gives an idea of its size and shape. The dark triangular outline near the right arytenoid prominence marks the only available breathing space. A tentative test, made with a probe, provoked a most intense inspiratory spasm, the intervals being prolonged almost to the point of suffocation.

Subsequent experiments resulted in similar manifestations. The patient would not listen to a proposition involving tracheotomy.

While in this dilemma, the idea occurred to me of utilizing chromic acid as an escharotic, applied frequently and in small quantities. The acid was therefore made use of in the manner explained.

I was at once reassured by the good behavior of the larynx. The gentle touch of the probe, laden with the chromium salt, produced neither cough nor spasm.

Applications were made daily, sometimes two or three at each sitting. The respiratory chink gradually widened under the eroding action of the escharotic, and on February 14th the discordant whisper was replaced by a loud, raucous voice. This effect was really accomplished in five days, there being an interruption of nine days, for which the patient was not responsible.

Fig. 3 represents the appearance of the growth on February 22d, shortly after the return of the patient's voice.

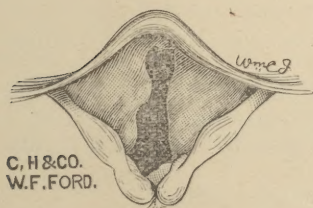


FIG. 4.

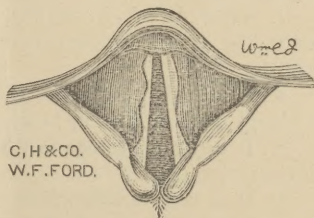


FIG. 5.

Fig. 4, copied from a sketch, taken just after the completion of the treatment, March 3, 1882, exhibits the irregularly cicatrized ventricular bands and the shape and size of the supra-glottic aperture. At this time the patient claimed she spoke and sang as well as ever.

Fig. 5 was photographed from a sketch taken March 4, 1884, two years after the completion of the treatment.

It shows the relation of the true cords and ventricular bands, and the slight changes of a beneficial character which occurred in that time.

I do not wish to be understood as confining myself to this measure for the removal of all laryngeal papillomata, although it was the only one employed in the case described. On the contrary, I have not hesitated to employ it in conjunction with the forceps or snare. I believe that a majority of those present will agree that in view of the facts just given the opprobrium attached to this beneficent measure is unjust and largely due to misapprehension or misuse.

No observations can be said to have acquired the honor of established facts until they have been verified by long-conducted and repeated experimentation. I have endeavored to constantly keep this in view while formulating these results, being well aware that bare assertion based upon insufficient data is scientifically valueless.

*Conclusions.*—In recapitulating I submit the following propositions :

1. Trioxide of chromium, or so-called chromic acid, is valuable as an escharotic on account of its self-limiting action.
2. It affords a safe and reliable means for the removal of large and small soft laryngeal growths.
3. It not only removes the growth, but also prevents its recurrence.
4. It is best applied fused upon a probe.
5. Its application is facilitated by an instrument devised to act as a guide, protector, and regulator.
6. Its use in the larynx is not necessarily attended with pain or spasm.
7. It offers a substitute for tracheotomy and thyrotomy in certain cases where these measures have been adjudged necessary.







*BY THE SAME AUTHOR.*

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